GENFIT
using GEANT4E

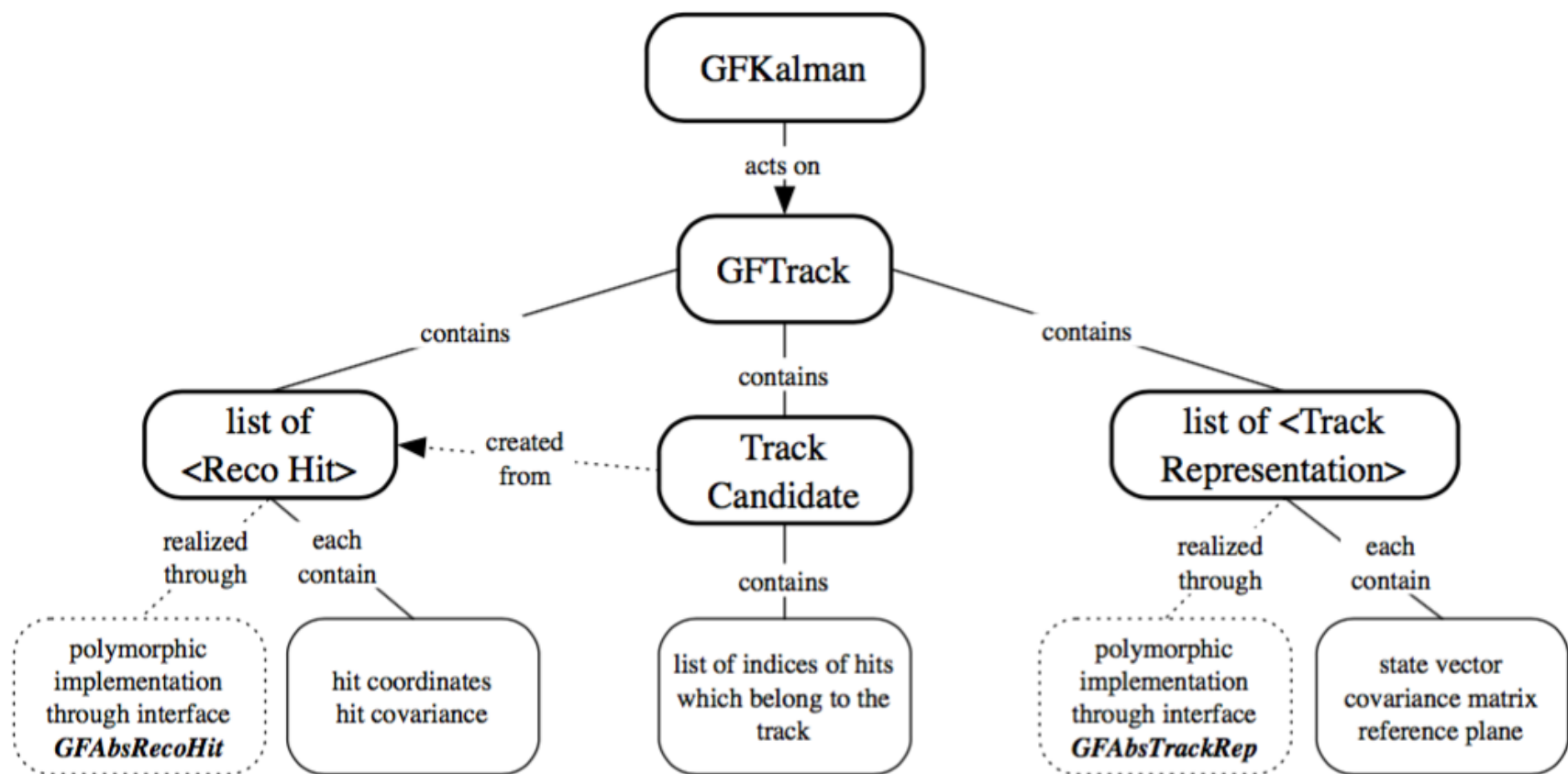Jin, Xiaorong, Haiwang

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Figure 1.1: General structure of GENFIT.

http://genfit.sourceforge.net/GENFIT_v1_2.pdf

Integrate Geant4e to GenFit

- Three pillars of GenFit:
  - AbsKalmanFilter
  - AbsMeasurement
  - AbsTrackRep
    - Detector/Field Information
    - Status/Error prediction

- RKTrackRep
  - ROOT Geometry (TGeo stuff)
  - Error propagation method from GEANE (Geant3)
  - Runge-Kutta method for tracking a particles through a magnetic field.

- G4eTrackRep
  - Hook Geant4E with AbsTrackRep interfaces.
  - Feed Geant4E with a G4 Detector. And it will take care of the material effect and propagation through magnetic field.

History

G4eTrackRep was implemented and included in GenFit v1.0, by Philipp Oehler
- https://sourceforge.net/p/genfit/code/HEAD/tree/tags/v01-00-00/
- I have trouble compiling it. And I didn't bother too much to do it.

Now GenFit evolved to v2.0
- Many changes in interfaces.

A G4eTrackRep's core function is very similar to Kun's kTracker.
- I am writing a new G4eTrackRep based on Philipp's and Kun's work.

Useful Links:

Code:
https://sourceforge.net/projects/genfit/
https://github.com/GenFit/GenFit

arxiv paper:
http://arxiv.org/pdf/1410.3698.pdf

C. Hoppner's thesis:
https://wwwcompass.cern.ch/compass/publications/theses/2012_phd_hoeppner.pdf

2012 J, Rauch: GENFIT Overview

2012, W. da Silva @ g-2: Track Fitting in GENFIT
https://indico.in2p3.fr/event/6637/contribution/15/material/slides/0.pdf
2014 T. Schlüter: Recent Changes in Genfit
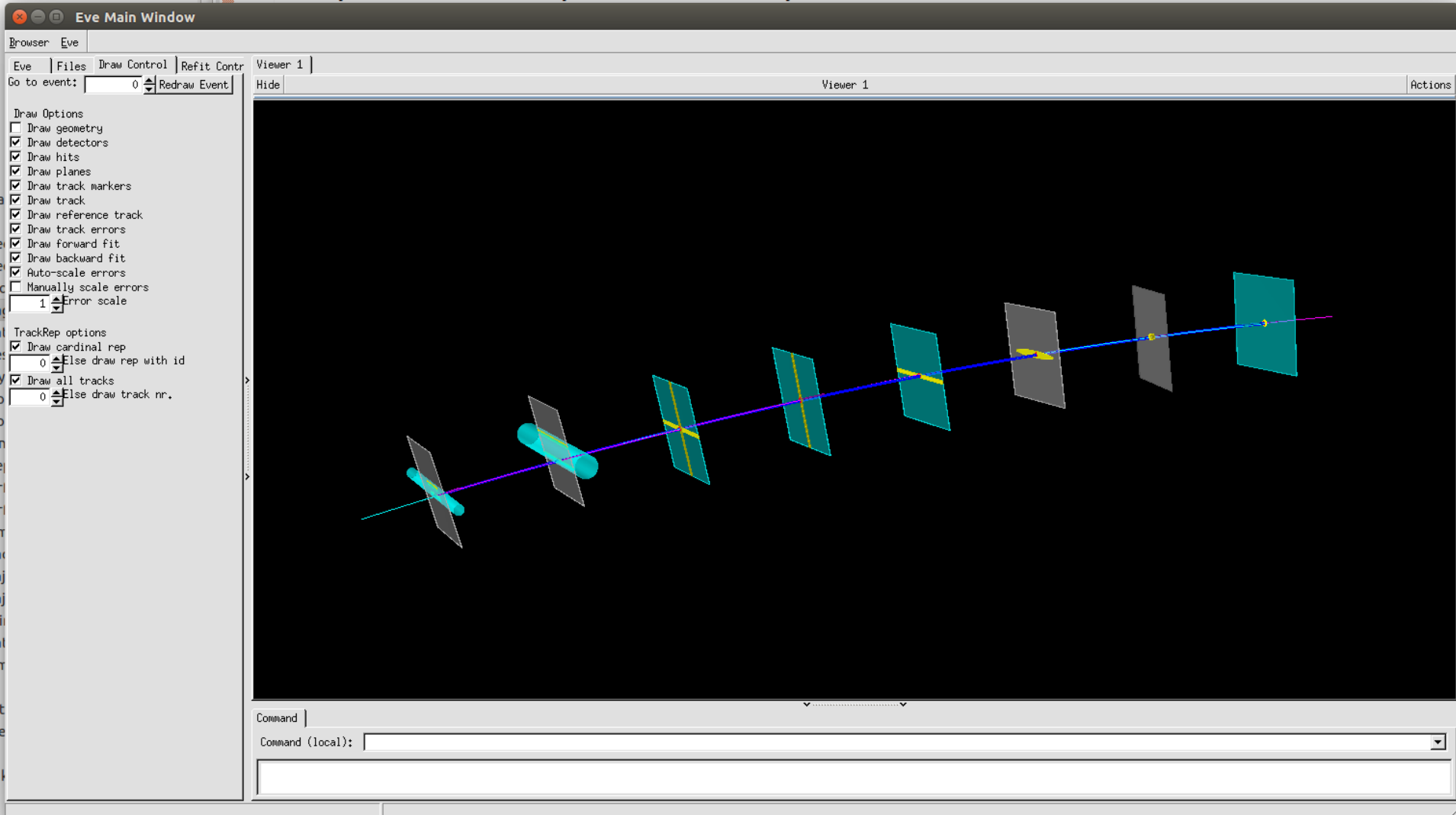https://indico.mpp.mpg.de/getFile.py/access?contribId=5&sessionId=1&resId=0&materialId=slides&confId=2966
2015, J. Rauch: GENFIT and its Application for the Belle II Experiment
https://indico.cern.ch/event/459865/contribution/2/attachments/1199055/1744107/GenfitTrackRecoForum.pdf

Backups

GenFit Event Display

Showing different types of measurements, From right to left:
pixel, space point, prolate space point, StripU, StripV, StripUV, Wire, Wirepoint

GenFit Event Display

Smoothed track: weighted average between forward fit and backward fit.